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Warfare by Fire

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THE PREDICTION has freely been made by chemical warfare sensationalists that the end of our civilization will come in a flood of gas. They would find greater military justification, as well as historical precedent, if they would choose fire as their obliterating agent. Indeed the one real danger, military experts agree, that large cities face in the next war is not poison gas but conflagration caused by incendiary bombs.

When the Armistice was signed the French found in German ammunition depots an enormous number of small aerial bombs weighing only about 2.2 lbs. Examination showed that they contained thermite, which would be ignited on striking and produce a small but intensely hot blaze. General Ludendorff's *Memoirs* published in 1919 explained that these small bombs were intended to set London and Paris on fire but were not ready for distribution until late in August, 1918, and by that time the German situation was so hopeless that the high command decided not to employ them. They figured that peace terms would be made harder if the two capitals were in ruins.

The small size of these bombs may appear almost ridiculous, considering the tons of gas that are required to produce lethal concentrations; but here comes the essential difference between gas bombs and incendiary bombs that makes the latter far more dangerous to a large city. Gas *dissipates* while fire *propagates*. Each of these small bombs held within itself the devastating possibilities of Mrs. O'Leary's cow.

The thermite in these bombs is a mixture of iron ore and powdered aluminum or magnesium. When any part of the mixture is heated to a high temperature a violent reaction spreads rapidly through the entire mass, and the iron flows out as an incandescent liquid at a temperature of about 5400° F., far hotter than the molten iron that runs from blast furnaces. Curiously, this rapid and violent reaction is almost noiseless.

Such small incendiary bombs are particularly fitted to airplane raiding. They do not have to be aimed; they can be scattered over the general area attacked. A single two-ton bomber could carry nearly 2000 of them. In fact, a bomber is not needed; they could be dropped by any plane.

War experience and recent maneuvers over large cities show that the attacking air force will always break through defenses to some extent. If only 10 two-ton planes broke through and only one effective hit was made out of 100 bombs, 200 fires would be started in a few minutes at widely separated points.

What 200 simultaneous fires would mean in a large city may be understood by considering that one single New York fire, at the Cunard pier in 1932, summoned one fifth of the city's total fire apparatus and that with probably the best-trained fire department in the world this fire could not be confined to one pier.

The silence with which the thermite bomb does its work constitutes an added danger. After the noise of the original crash through the roof or skylight, which might well pass unnoticed in the turmoil of a raid, no explosion follows to attract attention. Hence scores of fires might gain a considerable start before being discovered; and firemen maintain that at a fire "the first five minutes are worth the next five hours."

Aside from civilian demoralization and the suffering produced by a general conflagration, the destruction of railroad terminals, docks, and warehouses would be a serious handicap to mobilization

plans and the conduct of the war. This alone is sufficient incentive for a commander to employ thermite bombs in large quantities against enemy cities. And this may account for Europe's extreme caution at present in handling the most strained international relations. Every European capital is within easy flying distance of the frontiers of a potential enemy, and might be wiped out by an incendiary raid.

In America the same danger may become threatening before very long. With the Pacific spanned and the Atlantic in process of being spanned by commercial planes, the protection of the ocean may soon be illusory. The greater the urban areas in which population and wealth are concentrated, goods and staples warehoused, the greater the risk of staggering losses by conflagration which no retaliatory devastation, no land or sea victories, no territorial acquisition, no financial indemnity can ever compensate.

There should be a healthy side to this realization that war is no longer to be confined to a struggle between troops. When it becomes generally known that all civilians would be in the midst of it even though hundreds of miles from the front there will be less urge for nations to settle their difficulties by the insanity of armed conflict.